

# **Applying Six Sigma to Improve Diagnostic Imaging**

## **(Case Study)**

**1) Please write a short summary (of no more than 250 words) of the case. Please be sure indicate which case you picked (include link), why you picked it, and what it was about.**

- The selected case study is "Applying Six Sigma to Improve Diagnostic Imaging", which focuses on improving diagnostic imaging such as PET ( Positron Emission Tomography), PACS (Picture Archival Communication Systems), RIS (Radiology Information Systems), Ultrasound etc. It discusses the application of Six Sigma methodology which aimed at improving report turn around time, and increasing capacity and productivity. The process aims to eliminate non-value-added services, identify the root causes and mitigate redundancies to optimize the existing processes.
- The Case I picked is:- Applying Six Sigma to Improve Diagnostic Imaging.
- Here is the link to the case which I have picked:-
- <https://www.isixsigma.com/healthcare/applying-six-sigma-improve-diagnostic-imaging/>
- I picked this case because it demonstrates the practical application of Six Sigma in healthcare which is a sector with high stakes and potential for impactful improvements.
- This study is about how Six Sigma principle like DMAIC (Define, Measure, Analyze, Improve and Control) can streamline healthcare processes, eliminate bottlenecks and enhance service quality.
- Example from the case:- Carle Clinic achieved \$390,000 in annual revenue and improved satisfaction, while Baptist Citizens Medical Center added 260 additional CT slots and 780 additional US slots annually and made \$314,744 every year.

**2) What issue did the organization face and why did it need to be addressed?**

- The organizations faced delays in report turn around time and a backlog of patients waiting for appointments. Diminished capacity and productivity can lead to a various of problems for diagnostic imaging facilities or departments, including delays in diagnosis and treatment, emergency department bottlenecks, increased length of stay, patient dissatisfaction, referring physician dissatisfaction, potential loss of outpatient business, loss of revenue.
- Addressing these issues was critical for improving the quality of healthcare services. Diagnostic imaging plays a pivotal role in timely and accurate diagnosis, which directly affects treatment outcomes. Additionally, operational inefficiencies resulted in lost revenue opportunities and limited center's ability to meet growing patient demands. Resolving these challenges was essential for sustaining high-quality healthcare delivery, increasing capacity and achieving financial stability.
- Example from the case:- Baptist Citizen Medical Center faced inefficiencies that limited patient slots and Carle Clinic struggled with predictability in scheduling.

**3) How did they show that there was a problem?**

- During Define and Measure phases the organizations identified the problem by gathering Voice of the Customer(VOC) information through stakeholder interviews, Key Performance Indicators(KPI's) also are gathered including exam volume, exam duration and room utilization for all modalities; patient, referring physician and staff satisfaction,

and staffing to identify current operational performance relative to labor expense, revenue and operational quality metrics. Financial data is pulled from existing systems within the facility and cycle time data needs to be collected manually.

- Process mapping and sub-process mapping with assigned indicators for selected modalities helps to outline existing procedures within the department.
- Example:- In case of Carle Clinic long cycle time for CT exams leading to decreased capacity and patient satisfaction then they collected data on CT exam cycle time, patient wait times, technician availability and preparation delays. In case of Baptist Citizens Medical Center long cycle between patient out and next patient-in for imaging procedures, affecting capacity and patient throughput then collected data on patient throughput, technician work patterns, room utilization and transport delays.

#### **4) What analysis did they perform and what did that analysis indicate?**

- During the Analyze phase, the project team determines the most critical drivers that may impact the process under examination. Analysis may reveal issues such as slow start-up times in the mornings or scheduling conflicts with physicians. The information may also indicate that high volume of patients failing to show up for appointments is consuming capacity or that utilization fluctuates during the day due to bottlenecks in the system or variability in patient arrival patterns. With the analysis complete, the team then develops action plans recommends performance improvement opportunities that are aligned with the organization's strategic.
- The analysis indicated that slow startup times, patient not showing up, and suboptimal scheduling were the the primary causes of inefficiencies in diagnostic imaging.
- Example:- In case of Carle Clinic identified the root causes of delays that is late administration of contrast solutions and underutilized of preparation rooms and technician resources. In case of Baptist Citizens Medical Center identified key inefficiencies that is transport delays, rigid technician roles and outdated protocols that slowed patient flow and room turnover.

#### **5) How did they address the problems?**

- In the Improve phase often it is challenging, yet most rewarding part of the project. As the process changes are actually implemented, long-standing issues are finally addressed and better processes are put in place changes that will ultimately improve the overall effectiveness of the facility's diagnostic imaging services
- Example from the case:- Carle Clinic streamlined scheduling and trained staff, enhancing satisfaction. Baptist Citizens Medical Center expanded diagnostic slots by redesigning workflows. In case of Carle Clinic implemented changes like administering contrast earlier, using the MRI IV start room for CT prep and improving technician availability for charting and requisition tasks. In case of Baptist Citizens Medical Center optimized staffing by rotating CT technicians to X-ray, used radiology technicians to assist with transport, extended US technician hours and revamped workflows.

#### **6) What did they do to ensure the problem did not reemerge?**

- The Control phase begins once process changes have been established and appear to be working. The importance of monitoring results during this phase cannot be

underestimated. This is one of the most critical keys to long-term success and differentiating element for Six Sigma. During this phase, control tools are implemented such as dashboards or balanced scorecards to monitor key indicators and ensure that project gains remain on track. It is also important during the control phase to "institutionalize" the wins, celebrate success and in still ongoing change management capabilities through change management tools.

- Example:- In case of Carle Clinic monitored improvement using dashboards and key performance indicators to ensure long-term sustainability. In case of Baptist Citizens Medical Center establish monitoring systems to track times and labor utilizations and continued improvement by adjusting staffing and ensuring adherence to new protocols with regular performance reviews.

**7) What is your overall conclusion of the case? What did you like about the Six Sigma project? What would you have done differently? What was the most striking thing you learned from this case?**

- Process improvements and workflow adjustments using Six Sigma and other tools can have a measurable impact on cost and quality of services. Six Sigma levels of excellence in diagnostic imaging to develop a plan to accurately set and meet customer expectations, focus adequate attention on project selection and scoping, establish clear understanding of current operations and direction, determine and focus on key metrics and success indicators and do not underestimate the importance of the Control phase.
- I liked about the systematic approach of the DMAIC process which stood out.
- I would have included more proactive patient feedback mechanism to continuously adapt processes based on evolving needs.
- The most striking thing I have learned from this case is, the takeaway was the dual impact of Six Sigma on service quality and financial performance.